PO Box 518
620 Applegate St.
Philomath, OR 97370

(541) 929-5650
Fax (541) 929-5277
www.wetlabs.com

Scattering Meter Calibration Sheet

12/21/2015
Wavelength: 700 S/N FLBBCDSLC-4200

Use the following equation to obtain either digital or analog "scaled" output values:

$$\beta(\theta_c)\ m^{-1}\ sr^{-1} = \text{Scale Factor} \times (\text{Output} - \text{Dark Counts})$$

• **Scale Factor for 700 nm**	=	1.589E-06	$(m^{-1}sr^{-1})$/counts
• **Output**	=	meter output	counts
• **Dark Counts**	=	46	counts
Instrument Resolution	=	1.0	counts

Definitions:

- **Scale Factor**: Calibration scale factor, $\beta(\theta_c)$/counts. Refer to User's Guide for derivation.
- **Output**: Measured signal output of the scattering meter.
- **Dark Counts**: Signal obtained by covering detector with black tape and submersing sensor in water.

Instrument Resolution: Standard deviation of 1 minute of collected data.

PO Box 518
620 Applegate St.
Philomath, OR 97370

(541) 929-5650
Fax (541) 929-5277
www.wetlabs.com

ECO CDOM Fluorometer Characterization Sheet

Date: 12/21/2015 S/N: FLBBCDSLC-4200

CDOM concentration expressed in ppb can be derived using the equation:

CDOM (ppb) = Scale Factor * (Output - Dark Counts)

	Digital
Dark Counts	45 counts
Scale Factor (SF)	0.0906 ppb/count
Maximum Output	4130 counts
Resolution	1.0 counts
Ambient temperature during characterization	22.3 °C

Dark Counts: Signal output of the meter in clean water with black tape over detector.

SF: Determined using the following equation: SF = *x* ÷ (output - dark counts), where *x* is the concentration of the solution used during instrument characterization. SF is used to derive instrument output concentration from the raw signal output of the fluorometer.

Maximum Output: Maximum signal output the fluorometer is capable of.

Resolution: Standard deviation of 1 minute of collected data.

PO Box 518
620 Applegate St.
Philomath, OR 97370

(541) 929-5650
Fax (541) 929-5277
www.wetlabs.com

ECO Chlorophyll Fluorometer Characterization Sheet

Date: 12/21/2015 S/N: FLBBCDSLC-4200

Chlorophyll concentration expressed in µg/l can be derived using the equation:

CHL (µg/l) = Scale Factor * (Output - Dark counts)

	Digital
Dark counts	43 counts
Scale Factor (SF)	0.0073 µg/l/count
Maximum Output	4130 counts
Resolution	1.0 counts
Ambient temperature during characterization	22.3 °C

Dark Counts: Signal output of the meter in clean water with black tape over detector.

SF: Determined using the following equation: SF = x ÷ (output - dark counts), where x is the concentration of the solution used during instrument characterization. SF is used to derive instrument output concentration from the raw signal output of the fluorometer.

Maximum Output: Maximum signal output the fluorometer is capable of.

Resolution: Standard deviation of 1 minute of collected data.

The relationship between fluorescence and chlorophyll-a concentrations in-situ is highly variable. The scale factor listed on this document was determined using a mono-culture of phytoplankton (Thalassiosira weissflogii). The population was assumed to be reasonably healthy and the concentration was determined by using the absorption method. To accurately determine chlorophyll concentration using a fluorometer, you must perform secondary measurements on the populations of interest. This is typically done using extraction-based measurement techniques on discrete samples. For additional information on determining chlorophyll concentration see "Standard Methods for the Examination of Water and Wastewater" part 10200 H, published jointly by the American Public Health Association, American Water Works Association, and the Water Environment Federation.

PO Box 518
620 Applegate St.
Philomath, OR 97370

(541) 929-5650
Fax (541) 929-5277
www.wetlabs.com

SLC Testing Certification

Date 12/22/2015 S/N# FLBBCDSLC-4200

Low temperature test #1

Chill 2.5 hr at -20 °C

High temperature test #1 Verify operation post-testing

Heat 2.5 hr at 50 °C

Low temperature test #2 same protocol as #1

High temperature test #2 same protocol as #1

Vacuum test

< 0.1" Hg change in 10 min.

Pressure test

5 cycles, 0–1250 m with 10-sec. soaks
Held at 1250 m for 2 hrs. on last cycle

Electrical isolation

Resistance between copper faceplate and grounding wire is > 1 mΩ

Calibration verification

Verify calibration and dark counts in bb, chl, and CDOM channels

Verify 5% of single point check for chl and bb

Verify 10% of single point check for CDOM

Signature William Jason Rowe/Ann Gaidos-Morgan

NOTES:

620 Applegate St. Philomath, OR 97370 • 541-929-5650 • www.wetlabs.com

Tech Note 130508.1: *ECO*-SLC ground wire attachment

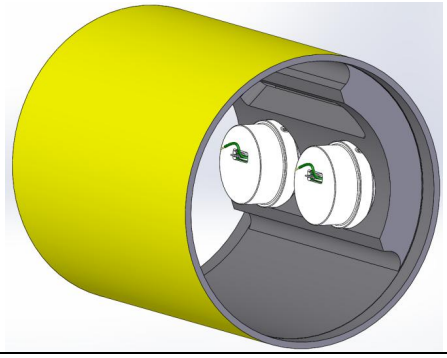
Reason for ground wire

The *ECO*-SLC sensors have a 22-gauge green wire coming out of the electronics protective cap. This wire is critical to the anodic protection of the *ECO*-SLC's aluminum optics end flange. Since this sensor is specially designed for TWR's Slocom glider and the sensor does not have its own anodic protection, the wire must be connected to the science bay and be electrically connected to an anode located on the glider.

Without anodic protection, the optics end flange will corrode over time and will cause the sensor to fail, and possible loss of the glider.

Location of ground wire

The green 22-gauge wire is grounded to the aluminum optics end flange and its conductivity is verified by WET Labs. The copper faceplate is isolated from the aluminum optics end flange to prevent rapid corrosion of the aluminum. Due to the anodization of the aluminum optics end flange and the isolation of the copper faceplate, verification of continuity between the aluminum and the wire cannot be performed on a completed sensor.



Attachment of ground wire

WET Labs provides only the wire to ground to the science bay. The wire end is bare, enabling TWR to attach to the inside of the science bay as to their design. Crimping a #4 ring terminal to the end and using a #4 screw threaded into the inside of the science bay is one method.

Any wire attachment point must be free of anodize (i.e. threaded hole). Anodize is an insulator and will not allow electrical continuity to a ground source, i.e. zinc anode.

Warranty voided

WET Labs is not responsible for any damage or loss of sensor due to corrosion caused by not connecting the *ECO*-SLC ground wire to an anodic source.